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NI-BASE SUPERALLOY HAVING A COATING SYSTEM CONTAINING A DIFFUSION BARRIER LAYER

Abstract

A coating system for an article comprising a substrate formed of a metal alloy that is prone to the formation of a deleterious secondary reaction zone (SRZ) as a result of containing more than three weight percent rhenium and at least one additional refractory metal. The coating system comprises an aluminum-containing overlay coating and a diffusion barrier coating between the overlay coating and the substrate. The diffusion barrier coating consists of, in atomic percent, about 20% to about 90% ruthenium, about 2% to about 60% chromium, optionally up to about 50% aluminum, optionally up to about 20% of a platinum-group metal, and the balance at least one of nickel, cobalt, and iron and incidental impurities. The diffusion barrier coating sufficiently inhibits diffusion of aluminum from the overlay coating into the substrate, such that the substrate remains essentially free of SRZ.